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THE RELATIONSHIP BETWEEN COLLEGE PLANNING AND THE BEHAVIORAL SCIENCES IS EXPLORED IN THIS PAPER. AREAS OF INTEREST INCLUDE--(1) THE CAMPUS SITE PLAN, (2) GROUP ATTITUDES AND PREFERENCES, (3) SPACE RELATIONSHIPS, (4) FLEXIBILITY AND OBSOLESCENCE, AND (5) THE CAMPUS POLITICAL ENVIRONMENT. THE POSSIBLE CONTRIBUTIONS OF BEHAVIORAL SCIENCE ARE MENTIONED AS--(1) SIMULATION OF GROUP RELATIONSHIPS, (2) THE CONTEXTUAL MAP, (3) BUILDING SAFETY AND ROLE CONFLICT, AND (4) ATTITUDINAL SAMPLING. SPECIFIC STUDIES AND EXAMPLES ARE ALSO DESCRIBED IN THE AREAS OF HOUSING PREFERENCES, SCIENCE FACILITY DESIGN, AND STUDY FACILITIES. SOME BIBLIOGRAPHIC MATERIAL IS PROVIDED. (MM)

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CAN THE BEHAVIORAL SCIENCES ASSIST PLANNING?

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Not as important as the pressure of increasing enrollments, nevertheless one cause of the current excitement in planning colleges and universities is the belief that the behavioral sciences offer opportunities for greater control over the physical environment for the benefit of the educational process and the general advantage of all the persons who use the facilities.

What We Know Now

Several years ago, Educational Facilities Laboratories, Inc. provided funds to permit the School of Architecture at the University of Michigan to collect and analyze the existing literature on environmental influences and the learning process. After several years of careful study and the preparation of an impressive report, that is mandatory background reading, the general conclusion seems to be that not very much is known as to the precise effects of environment on human behavior in the process of learning (1).

A major focus of college and university planning has been the design of the campus site plan. Therefore, the recent studies by sociologist, Robert Gutman, of social science knowledge concerning the site plan is of special interest (2). Although he found extensive literature, he was not able to find confirmation of the hypothesis that differences in site plans were responsible for corresponding differences in behavior.

A study conducted about 10 years ago at Stanford University, demonstrated how significantly the broader social context can influence attitudes towards facilities (3). This study was a test of a theory that an individual's membership group has an important influence on the values and attitudes he holds. The study examined the attitude changes which

occurred over a period of time when reference groups and membership groups were identical and when they were changed. The subjects of the study were women students who all lived in the same large freshmen dormitory to which they had been assigned when they entered the university. Following the normal practice at the university, all of the women expected to change housing for their sophomore year and participated in a drawing using secret ballots to rank the available choices in order of preference. Several types of housing were available: a large dormitory, a medium size dormitory, several very small houses which shared common dining facilities, and a number of former sorority houses which were operated by the university since sororities were banished from the campus. The latter were located among the fraternity houses on fraternity row. Although the fraternity row houses were lower in physical comfort than the other residences for women, the students considered them higher in social status and they were the overwhelming choice. After the sophomore year, the women were offered the opportunity to draw again if they wished to change their housing. The women who succeeded in assignments to row houses during the first drawing did not wish to change, however; more than half the women who did not succeed initially in gaining assignment to the lower comfort row houses drew again in hope of being successful. However, a substantial number displayed considerable attitude change in accepting the imposed, initially non-preferred housing.

The View From The Acropolis of Science

My observation position provides a narrow view of college and university

planning based on the National Science Foundation's support for the construction and renovation of science facilities. While I lean heavily on my own observations in making some rather broad generalizations, I hope that the ideas will be interesting and a stimulant for discussion even if their extension to broader planning issues may not be entirely correct.

The construction of science facilities has proceeded vigorously in recent years and growth in scientific education and research has presented its share of planning problems. Science facilities seem to be more expensive, require the greatest space allocations per person, become obsolete as soon as they are completed, create special servicing and traffic problems, produce odors and air pollution, and generally disturb the peace on well planned campuses. Now they are weakening the classical conception of a campus with the proliferation of field stations, observatories, accelerators, and reactors that may be located off-campus—distances of a few miles to as far away as another continent—often in cooperation and joint ownership with several other institutions. Professor C. T. Larson has pointed out that the new international superhighways may be a forerunner of the universal city (4). A standing joke among university science faculty members—that they see each other more often at airport terminals than on campus—may indicate that the universal campus is already in an advanced stage of development. City planning today recognizes that the "neighborhood" can reside inside the person, who carries it about with him by car, bus, train, foot,

telephone and perhaps plane. Communication technology can substitute for locational proximity (5).

It is easy to expand the general trend of these ideas to the point where we can no longer be confident of our ability to plan. The current planning literature emphasizes man's limited problem solving capabilities, the absence of truly comprehensive information, the great cost of comprehensive analysis, failure to find goals on which the whole community can agree, the difficulty of evaluating values and goals, and the inability to predict the future as much as five year or so (6).

Most planners and architects share the view that the behavioral sciences offer great promise for reaching better solutions in the future through improvement of the ability to describe the environment and perhaps, to understand the kinds of responses that are influenced by the physical surroundings. The greatest hopes are that behavioral sciences will help our prediction ability and lead to the discovery and achievement of goals that will have general acceptance.

One of the planning problems I have seen involving both science facilities and the whole university or college, concerns the goal of flexibility. Everyone in the sciences and in academic administration is concerned with the difficulties and expense associated with the need to update obsolescing science facilities. At the moment, the most common approach is to make the achievement of flexibility a part of the task of the architect engaged to design or renovate a building. The architect usually approaches this assignment through the use of a variety of techniques such as: movable partitions, demountable walls, extra space

in utility shafts, oversize service lines, etc. However, many wise members of the scientific faculty seem to prefer an entirely different approach, they prefer to have every working station equipped with every service for which a future need can be anticipated. To the extent that they can succeed, they also would like to have the maximum number of auxiliary spaces with general labels, such as, instrument rooms, preparation rooms, etc. It is clear that they doubt the movable partitions, demountable walls, and capacious service shafts will be activated when the need arises. The architect's approach has not always worked well and the staffs' solution is imperfect also since they cannot anticipate the future with great accuracy.

It may seem trite to say that buildings are not flexible, they are rigid, yet the misunderstandings and problems with science building flexibility usually reflects an inadequate operational understanding of the way the institution proceeds with the execution of physical changes to its plant. Movable partitions do not move themselves; plumbers and electricians must be hired to run in new service lines even when space has been provided. The solution of the science faculty just referred to, reflects their lack of confidence that the architect's approach has been properly complimented by the broad institutional planning for funding and procedures that will make the necessary changes and additions possible quickly. Better understanding of the history of decision making and the related political environment within and without the campus may make it possible to supply some of the missing information

that would help to determine that movable partitions, in a particular case, are an unsuitable solution because of characteristic delays in arranging for the execution of a work order. There may be other solutions that make better sense for the particular institution. Bringing such problems to the surface should help substantially in improving planning decisions and the staffs' cooperation with decisions made for meeting future needs.

Some Promising Areas for Behavioral Science Assistance

Recent grants to develop campus planning models and attempt computer simulation at Duke University and the University of Washington are hopeful efforts towards expressing the relationships between students, staff, and space as a result of past administrative decisions. If successful, these approaches may be useful in discovering trends which can be analyzed for criteria to aid in exploring effects of alternative future planning actions.

A promising technique from the behavioral sciences is called the contextual map (7). This technique was developed by a psychologist, a political scientist, an economist, and an anthropologist who were confronted with the need to develop a ten year program for rapid cultural and technical development in an underdeveloped region of Peru. Study participants were able to draw upon data collected in five years of field operations and the quantity of available information created one of the characteristic difficulties in planning. The need to organize and unify data about a very large number of interacting variables. The contextual map was

developed to keep track of the evolving plan and act as a group memory. The map was made up of brief items of information by using small index cards to serve as modular components of the map matrix. All information and ideas included in the map had to be condensed or subdivided to a size that could be written on a module. Once prepared, an information module was always displayed and served as a superior memory for the participants as they sought the most meaningful groupings. The modular size of the cards let them serve as idea or data units and permitted freedom in shifting them about to link ideas within the map as the developing concept of the program dictated. *Therefore, the map as a* whole always displayed the total context of the planning situation. The construction of the map extended backward into time for five years using the accumulated field data and provided for systematic comparisons between the status of variables, as predicted during the field work, and actual events. Thus, making possible the improvement of prediction methods employed to plan ahead. The significant success of this planning technique in bringing about a major change in the community was reported at the 1964 meeting of the American Association for the Advancement of Science (8).

Perhaps the use of this and similar techniques by behavioral scientists in collaboration with the planners who are exploring the use of computer simulation of operational models for college and university development history can help to solve intermediate term planning problems such as science facility flexibility.

Safety of science facilities, like flexibility, is another important concern in my work for the Foundation. Safety is also a primary goal of the campus planner. However, it has been my observation that little of the available time of the college and university planner is occupied with the pursuit of solutions to general safety problems. Similar comments have been made about the allocation of city planners' time and energy in relation to the major goals of planning. Studies of the role of the planner in urban development provide several interesting suggestions (9). The major roles of the planner have been found to include: his administration of his own organization, his role in relation to the planning profession, his role in political innovation, and his role as an educator of public awareness to his planning objectives. The differences in these roles are significant and cause conflicts and pressures on the planners. For example, political innovation has been found to be his most important role for success in carrying our improvements to the plan of his community. On the other hand, his self-esteem in his role as a professional planner depends greatly upon his performance of tasks which are highly esteemed by his planner peers, such as, preparing master plans. Is there the possibility that this type of role conflict is also related to the priorities given by college and university planners to various kinds of tasks? There may be as much benefit from application of behavioral science techniques to better understand planners as to the understanding of student and staff reactions to various campus plans.

Have planners devoted appropriate effort to improving the applicable building codes and ordinances? The occupancy classification applied to colleges and universities determines the code provisions that must be followed. Usually, a general educational occupancy classification it used that does not cover adequately the variety of facilities that occur. Many of the buildings used in science and engineering, as well as maintenance and shop facilities, would be more appropriately covered by codes under an industrial occupancy classification then they are under the educational classification. With 22 large loss fires at educational institutions in both 1965 and 1966 causing about $11,000,000 worth of damages each year; with personal injuries in science buildings representing a major component of campus accidents, such matters would seem to warrant greater attention from college and university planners than they currently receive.

The behavioral sciences offer particular promise for the improvement of planning procedures through better sampling and information gathering techniques. It seems likely that some of the techniques already developed may help improve planning criteria and provide a better understanding of preferences, requirements, and needs through objective interviewing and sampling of representative groups of people. Such techniques can provide planning criteria superior to those currently employed because the impressions of a few individuals may be far different from the typical impressions of a large group of people who will use the facilities. At your first annual conference,

Byron Stookey called these individual impressions, micro-insights, and provided illustrations of how they are often bad metaphors, simply foolish, or out of date (10). An illustration of the type of study which holds considerable promise is the investigation of student reactions to study facilities conducted by a committee of representatives from five New England colleges under the auspicious of the Committee for New College (11). The study collected samples of student behavior and opinions from Amherst, Mount Holyoke and Smith Colleges and the University of Massachusetts. Participating sophomores, juniors, and seniors were selected from a variety of dormitories, fracternity and sorority housing and representing each of the major divisions of academic specialization. Three separate sets of information were collected to permit cross checking of an individual student's answers and to established the validity of the data. The sources of the three sets of data were student diaries, special comment sheets, and questionnaires. The information obtained through the questionnaires was graded in degrees of preferences. The study results confirm the importance of large and careful selected samples because many atypical individuals were found during the analyses of student reactions. However, very strong preferences were also found, i.e., there is a strong preference for studying in small places where a student may work alone or with only one or two others; the large library reading room is disliked by most students even though it may be used out of lack of a better facility. Three of the design criteria

emanating from this study are: the larger study hall, the more it should be broken up with other functions and facilities which may reduce traffic and noise without interfering with study; rooms large enough for 20 to 40 students should not be planned for more than 15 to 20 percent of the students provided there are a sufficient number of smaller and individual study stations; and a variety of kinds of study spaces are needed to provide satisfactory study spaces for all of the students.

Conclusion

The knowledge available to us now from the behavioral sciences provides little guidance for preparing long range development plans that will insure or enhance specific behavior patterns. However, some techniques have been developed that seem applicable to the solution of specific problems and for the development of planning criteria. Interest in following these leads is growing among architects and planners. It may be that the results will be expressed only in terms of needs for further research. It seems certain however, that better insights into the operational problems of colleges and universities, understanding of the decision making processes for facilities, and recognition by the planner of his most effective roles should provide an improved basis for planning. Similarly, better data should be useful even if it makes the world of higher education seem more complex.

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